

Translation

## PATENT COOPERATION TREATY



## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2001P09973WO	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE2003/002272	International filing date (day/month/year) 07 July 2003 (07.07.2003)	Priority date (day/month/year) 09 August 2002 (09.08.2002)
International Patent Classification (IPC) or national classification and IPC H04J 14/06		
Applicant <b>SIEMENS AKTIENGESELLSCHAFT</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I  Basis of the report
- II  Priority
- III  Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV  Lack of unity of invention
- V  Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI  Certain documents cited
- VII  Certain defects in the international application
- VIII  Certain observations on the international application

Date of submission of the demand 19 February 2004 (19.02.2004)	Date of completion of this report 10 November 2004 (10.11.2004)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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International application No.

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**I. Basis of the report**

1. This report has been drawn on the basis of (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

- the international application as originally filed.
- the description, pages 1,3-16, as originally filed,  
pages \_\_\_\_\_, filed with the demand,  
pages 2,2a, filed with the letter of 13 October 2004 (13.10.2004),  
pages \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- the claims, Nos. 1, as originally filed,  
Nos. \_\_\_\_\_, as amended under Article 19,  
Nos. \_\_\_\_\_, filed with the demand,  
Nos. 2-12, filed with the letter of 13 October 2004 (13.10.2004),  
Nos. \_\_\_\_\_, filed with the letter of \_\_\_\_\_.
- the drawings, sheets/fig 1/3-3/3, as originally filed,  
sheets/fig \_\_\_\_\_, filed with the demand,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_,  
sheets/fig \_\_\_\_\_, filed with the letter of \_\_\_\_\_.

2. The amendments have resulted in the cancellation of:

- the description, pages \_\_\_\_\_
- the claims, Nos. \_\_\_\_\_
- the drawings, sheets/fig \_\_\_\_\_

3.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

4. Additional observations, if necessary:

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-12	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-12	NO
Industrial applicability (IA)	Claims	1-12	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following documents:

D1: HEISMANN F ET AL: "AUTOMATIC POLARISATION DEMULTIPLEXER FOR POLARISATION-MULTIPLEXED TRANSMISSION SYSTEMS" ELECTRONICS LETTERS, IEE STEVENAGE, GB, vol. 29, no. 22, 28 October 1993 (1993-10-28), pages 1965-1966, XP000421562 ISSN: 0013-5194

D2: BIGO S ET AL: "10.2Tbit/s (256X42.7Gbit/s PDM/WDM) transmission over 100km TeraLight fiber with 1.28bit/s/Hz spectral efficiency" OPTICAL FIBER COMMUNICATION CONFERENCE. (OFC). TECHNICAL DIGEST POSTCONFERENCE EDITION. ANAHEIM, CA, MARCH 17-22, 2001, TRENDS IN OPTICS AND PHOTONICS SERIES. TOPS. VOLUME 54, WASHINGTON, WA: OSA, US, vol. 1 of 4, 17 March 2001 (2001-03-17), pages PD251-PD253, XP010545710 ISBN: 1-55752-655-9

- The present application does not meet the requirements of PCT Article 33(1) because the subject matter of claims 1-12 does not involve an inventive step within the meaning of PCT Article 33(3).

1.I D1, which is considered to represent the closest prior art, discloses (the references in parentheses are to this document) :

Process for transmitting at least a first and a second data signal in a polarisation multiplex in an optical transmission system (page 1965, left-hand column, lines 1-6),

- in which, in a first step, at the transmitter end the first data signal is modulated to a band of a first carrier signal in order to generate a first modulated signal and the second data signal is modulated to a band of a second carrier signal in order to generate a second modulated signal (page 1965, right-hand column, lines 9-12, and figure 1),
- in which, in a second step, the first and the second sideband-modulated signals are polarised orthogonally to each other, combined to form an optical multiplex signal and transmitted (page 1965, right-hand column, lines 12-15, and figure 1),
- in which, in a third step, at the receiver end the optical multiplex signal is guided via a polarisation actuator to a polarisation splitter, which separates the transmitted optical multiplex signal into the first and the second modulated signals (page 1965, right-hand column, lines 28-31, and figure 1),
- in which, in a fourth step, the first sideband-modulated signal is converted into a first electrical signal and/or the second sideband-

modulated signal is converted into a second electrical signal (page 1965, right-hand column, lines 32-33, and figure 1),

- in which, in a fifth step, the first and/or the second electrical signal is/are evaluated and at least one control signal for controlling the polarisation actuator is derived on the basis of this evaluation (page 1965, right-hand column, lines 38-52, and figure 1),

from which the subject matter of claim 1 differs in that the first data signal and the second data signal are modulated to sideband-modulated signals.

1.II The problem addressed by the present invention may therefore be considered that of increasing spectral efficiency.

1.III The solution proposed to this problem in claim 1 of the present application cannot be considered to involve an inventive step (PCT Article 33(3)). The reasons are:

D2 describes the same advantages with respect to the feature of single-sideband modulation in a polarisation multiplex transmission system (D2, page PD25-1, lines 12-13) as does the present application. A person skilled in the art would therefore consider the inclusion of this feature in the transmission system described in D1 to be a routine design measure for solving the problem of interest.

1.IV Dependent claims 2-12 do not contain any features which, in combination with the features of any claim

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to which they refer back, meet the PCT requirements for inventive step (PCT Article 33(3)) (see D1 and D2 and the corresponding passages indicated in the search report).

- 1.V The subject matter of claims 1-12 pertains to a process for transmitting a first and a second data signal in a polarisation multiplex in an optical transmission system and is therefore industrially applicable.